REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-20 are presently active in this case. Claims 1-6 and 8-17 are amended, and Claims 18-20 are added by the present amendment. Support for the amendment can be found at least at FIGs. 8(a) – 11 and page 23, line 9 – page 26, line 20 of the specification. Thus, it is respectfully submitted that no new matter is added.

In the outstanding Office Action, Claims 1 and 12-16 were rejected under 35 U.S.C. § 102(e) as anticipated by Liang (U.S. Patent No. 5,786,908). Claims 2-4 were rejected under 35 U.S.C. § 103(a) as unpatentable over Liang in view of Tabata, et al. (U.S. Patent No. 6,342,950, herein "Tabata"). Claims 6-9 and 17 were rejected under 35 U.S.C. § 103(a) as unpatentable over Liang in view of Hudson, et al. (U.S. Patent No. 6,057,933, herein "Hudson").

Claims 5 and 10-11 were objected to as dependent upon a rejected base claim but were indicated as allowable if rewritten in independent form. Applicants gratefully acknowledge the Examiner's indication of allowable subject matter. In light of this indication, new Claims 18-20 correspond respectively to original Claims 5 and 10-11 rewritten in independent form. Accordingly, it is respectfully submitted that new Claims 18-20 are allowable.

Applicants and Applicants' representatives thank Examiner Saeid Ebrahimi-Dehkordy and Supervisory Examiner Kimberly Williams for the courtesies extended during the personal interview conducted on September 7, 2004. During the personal interview, claim amendments corresponding substantially to those included herein were discussed in light of the cited references. As reflected by the interview summary, the Examiners noted that further exemplifying "a current printing condition" in the original claims may distinguish over the art

of record. In light of the personal interview, independent Claims 1, 6, and 12 are amended to include features corresponding substantially to those discussed during the interview.

Addressing now the rejection of Claims 1 and 12-16 under 35 U.S.C. § 102(e) as anticipated by Liang, that rejection is respectfully traversed.

Amended Claim 1 is directed to a data converter configured to convert color image data into a specific data form expressible with ink by referring to a preset conversion table. Further, amended Claim 1 recites a conversion table receiving unit configured to receive a conversion table from a computer *in accordance with a current printing condition* of an image. Moreover, the current printing condition includes at least one of *a medium type, a printing resolution, an image attribute, and an ink type.* Claims 6, 12, and 17 are amended in a substantially similar manner as Claim 1.

In a non-limiting exemplary embodiment, FIG. 10 illustrates a flowchart of a printing operation using a preset conversion table carried out by a computer and a data converter. After setting printing conditions S200, a computer selects a conversion table according to a printing condition S210 (for example, from a number of conversion tables mapped to various printing conditions stored on a hard disk 84). The computer selects a conversion table corresponding to a printing condition according to, for example, a mapping table such as that illustrated in FIG. 11. As shown in this exemplary figure, an image attribute includes an indicator of whether or not an image is a natural image. The computer then outputs the selected conversion table S220 to a data converter. The computer outputs image data to the data converter S230. Having received and stored the conversion table S240, the data converter converts the received image data S250 and outputs the converted data S260 to, for example, a printer.

As described in Applicants' specification, a conversion table is selected according to a printing condition due to a variation in ink blot. For example, as illustrated in FIGs. 8(a) and

9(b), different types of printing paper, printing resolution, and inks result in variation of a mixing state or characteristics of inks, thus varying color expression.[1]

Liang describes an apparatus for converting and for matching color values between color spaces including a regular primary look-up-table (LUT) for converting received image signals into second space color values and for supplying the second color values to a peripheral device.[2] In particular, Liang describes the generation of a primary LUT 12 (or 12') used in a color space converter 11 (or 11') for converting between a device dependent color space and a device independent color space.[3] Liang also describes generation of first 80, 96, second 80, 98, and third (inverse) LUTs for generating one primary LUT 12' to convert among, for example, CYMK, Lab, and RGB color spaces. The generation of the LUTs involves printing and scanning sets of color patches 92 and the application of a correction factor.[4] Additionally, Liang also describes an embodiment including color converters 11 and 11" with first and second primary LUT generators 13 and 13", and LUTs 12 being precalculated and stored in the color converters 11 and 11".[5] However, Liang does not teach or suggest that a LUT is received by a conversion table receiving unit *in accordance with a current printing condition of an image*, a feature explicitly recited in the claims.

In particular, Applicants respectfully note that Liang generally describes an apparatus *generation* of a primary LUT 12, 12'. As discussed in Applicants' specification with regard to the background art, computation based on the Neugebauer theory, a known technique for converting color expression, at every time of conversion lowers a speed of the overall

[1] See the Specification at page 8, line 26 – page 9, 13, page 23, line 9 – page 27, line 25, and page 29, line 1 – page 30, line 2.
[2] Liang at Abstract.
[3] *Ibid.* at Col. 12, lines 11-34.
[4] *Ibid.* at Col. 13, line 1 – Col. 15, line 64.
[5] *Ibid.* at FIG. 8 and Col. 19, lines 11-43.

conversion.[6] Thus, it is respectfully submitted that the generation of LUTs described by Liang would likely result in additional computing resources and cost or decreased color conversion performance when compared to a data converter utilizing a preset LUT.

Furthermore, the LUTs 12, 12', 12", 96, 98 of Liang are not received by the color converter 11, 11', 11" in accordance with a current printing condition of an image, where the current printing condition includes at least one of a medium type, a printing resolution, an image attribute, and an ink type. Instead, it is respectfully submitted that the first 96, second 98, and third (inverse) LUTs of Liang are generated and utilized in series to generate a primary LUT 12, 12', 12" for converting between color spaces.[7] Alternatively, Liang describes that the operation of the embodiment including multiple precalculated and stored LUTs 12 is "simply a serial conversion of the first plurality of values in a first, device dependent color space to a plurality of values in a device independent color space to a second plurality of color image values in a second device dependent color space."[8] Therefore, Liang does not teach or suggest that generation or selection of LUTs according to a current printing condition of an image including at least one of *a medium type, a printing resolution, an image attribute, and an ink type.*

Accordingly, Applicants respectfully request the withdrawal of the rejection of Claims 1 and 12-16.

Moving now to the rejection of Claims 2-4 under 35 U.S.C. § 103(a) as unpatentable over Liang in view of Tabata, that rejection is respectfully traversed.

As discussed above, Liang does not teach at least a conversion table receiving unit configured to receive a conversion table from a computer in accordance with a current printing condition of an image. Tabata describes a method an apparatus for compressing an

[6] See the Specification at page 1, line 25 – page 2, line 4.
[7] For example, see Liang at Col. 13, line 1 – Col. 14, line 65.

image in which required resolution and tone characteristics are maintained depending on the type of the image.[9] Additionally, Tabata describes the use of a look-up table (LUT) for converting an input image signal into a representation associated with an ink amount and performing a correction such that the signal falls within the color reproduction range of an output device during a compression or decoding process. The LUT of Tabata is taught as providing a corrected ink amount signal as a result of compression or decoding performed on the image data.[10] Thus, it is respectfully submitted that the LUT of Tabata is also not received in accordance with a current printing condition of an image including at least one of a medium type, a printing resolution, an image attribute, and an ink type. Therefore, Tabata does not remedy the noted deficiencies of Liang with respect to amended Claim 1.

Accordingly, Applicants respectfully request the withdrawal of the rejection of Claims 2-4.

Regarding the rejection of Claims 6-9 and 17 under 35 U.S.C. § 103(a) as unpatentable over Liang in view of Hudson, that rejection is respectfully traversed.

As noted above, Liang does not teach at least a conversion table receiving unit configured to receive a conversion table from a computer in accordance with a current printing condition of an image. Hudson describes an error diffusion technique which employs a look-up table containing precalculated values.[11] In particular, separate look-up tables 42- 47 are provided for different color inks to perform a color conversion between RGB and CMYK ink spaces. The look-up tables 42-47 output values corresponding to a base output level, a base level error term, and a threshold error term. [12] A separate look-up table 51 or algorithm for generating a threshold (Th) for each cell is also provided. Total error for

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[8] *Ibid.* at Col. 19, lines 26-30.
[9] Tabata at Col. 1, lines 40-45.
[10] *Ibid.* at FIG. 50 and Col. 15, lines 8-31.
[11] Hudson at Col. 1, lines 5-8.
[12] *Ibid.* at Col. 4, lines 9-63.

a cell is compared against the threshold to determine if an increment in a base output level is required.[13] Further, Hudson describes adjusting an aggregate number of dots printed (a resolution) by 10% to compensate a case where a print cartridge firing drop volume is approximately 10% below normal. Such a case would require a "simple 10% scaling of the error term output by the look-up table for each tone entry."[14] Additionally, entries in the tables can take into account a non-linear nature of an ink-on-paper color space for certain types of paper by incorporating an exponential relationship into the tables.[15] Alternatively, FIG. 6 illustrates an implementation in which both cyan and magenta base output levels are incremented in the same cell only when certain criteria are met, even though both cyan and magenta errors are above a threshold (Th).

However, unlike the claims as currently written, it is respectfully submitted that Hudson suggests *alteration* of values output by the look-up tables, such scaling look-up table values or rule-based incrementation of cell values. Thus, it is respectfully submitted that the look-up tables of Hudson are not received in accordance with either a paper type or an ink color (for example, cyan and magenta). Additionally, it is respectfully submitted that providing a separate LUT for each color ink in Hudson does not teach receiving a LUT in accordance with a printing condition of an image including an ink type, a feature recited in the claims, since different ink types for a given color can result in variance in color expression.[16]

Therefore, Hudson does not remedy the noted deficiency of Liang with respect to amended Claims 6 and 17.

Accordingly, Applicants respectfully request the withdrawal of the rejection of

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[13] *Ibid.* at Col. 5, lines 16-30.
[14] *Ibid.* at Col. 6, lines 16-29.
[15] *Ibid.* at Col. 6, lines 30-38.
[16] See Specification at FIGs. 9(a)-9(b), and page 26, lines 7-20.

Claims 6-9 and 17.

Consequently, in view of the above discussion, it is respectfully submitted that the present application is in condition for formal allowance, and an early and favorable reconsideration of this application is therefore requested.

Respectfully submitted,

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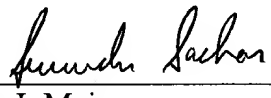

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